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Application No. 09/683,239

Amendments to the Specification:

1. Please **replace** paragraph following [*In Cross Reference To Related Applications*] with the following amended paragraph:

Priority is claimed from U.S. Provisional Application No. 60/311,857, filed August 13, 2001. Cross-reference is made to U.S. Patent Application Serial No. 09/543,962, entitled "Meta-Document And Method Of Managing", and U.S. Patent Application Serial No. 09/928,619 entitled "Fuzzy Text Categorizer", which are both hereby incorporated herein by reference. In addition, cross-reference is made to the following U.S. Patent Applications that (a) are concurrently filed herewith, (b) are assigned to the same assignee as the present invention, (c) are incorporated in this patent application by reference, and (d) claim priority to U.S. Patent Application Serial No. 60/311,857, filed August 13, 2001: U.S. Patent Application Serial No. 09/683,238, entitled "Meta-Document Management System With Personality Identifiers"; U.S. Patent Application Serial No. 09/683,240, entitled "Meta-Document Management System With Transit Triggered Enrichment"; U.S. patent application Serial No. 09/683,236, entitled "Meta-Document Management System With User Definable Personalities." (now U.S. Pat. No. 6,732,090); U.S. Patent Application Serial No. 09/683,241, entitled "System For Propagating Enrichment Between Documents"; U.S. Patent Application Serial No. 09/683,235, entitled "System For Automatically Generating Queries" (now U.S. Pat. No. 6,778,979); U.S. Patent Application Serial No. 09/683,242, entitled "Document-Centric System With Auto-Completion " (now U.S. Pat. No. 6,820,075); U.S. Patent Application Serial No. 09/683,237, entitled "System With User Directed Enrichment And Import/Export Control".

2. Please **replace** paragraph following [001] with the following amended paragraph:

The invention relates generally to the management and use of documents, and in particular, to improved management and use of documents which may act as agents, generating requests for information, then seeking, retrieving and packaging responses to enrich the documents while facilitating reading comprehension, understanding relationships with other documents, and content creation. In particular

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this invention relates to [[device]] devices for recording a document identifier and communicating it along with a personality identifier associated with the device to a meta-document server for enrichment.

3. Please **replace** paragraph **following [011]** with the following amended paragraph:

In accordance with another aspect of the invention, there is provided a method for enriching documents that includes: selecting a [[personality]] document identifier at a mobile computing device; identifying position coordinates of the mobile computing device where the [[personality]] document identifier is selected; looking up a [[document]] personality identifier using the position coordinates at the mobile computing device; transmitting the document identifier and the personality identifier from the reading device to a meta-document server; and enriching the electronic document content identified with the document identifier with the personality identified by the personality identifier.

4. Please **replace** paragraph **following [012]** with the following amended paragraph:

In accordance with yet another aspect of the invention, there is provided a method for enriching documents that includes: selecting a [[personality]] document identifier at a mobile computing device; identifying position coordinates where the [[personality]] document identifier is selected; transmitting the position coordinates and the personality identifier from the reading device to a meta-document server; looking up a [[document]] personality identifier using the position coordinates at the meta-document server; and enriching the electronic document content identified with the document identifier with the personality identified by the personality identifier.

5. Please **replace** paragraph **following [158]** with the following amended paragraph:

This section pertains to methods for attaching personalities to documents, whether physical or in electronic form, and to objects, whether animate or inanimate.

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That is, depending on the particular form of the document, there exist different manners in which to preferably attach personalities thereto. Once a personality is attached, an enriched view of the document can be produced using the meta-document management system. Users of the meta-document management system can then be notified using the notification service when further enrichments of interest take place to the document. The general steps for attaching a personality to a document include: (a) uploading the document to a meta-document server; (b) attaching one or more [[personality]] personalities to the document; (c) periodically enriching the document in accordance with the personality.

6. Please **replace** paragraph **following [164]** with the following amended paragraph:

The electronic identification tag reader 506 includes transmitter and receiver components that are integrated [[with in]] within its computer system. The tag reader momentarily energizes the tag through its coil until it has sufficient power for transient transmission of its personality identifier. The communication between the tag 502 and the tag reader 506 only occurs when both are proximate, with an actual distance varying based on size of the antenna attached to the tag and to the transmitter, from a distance of a few inches to that of several feet.

7. Please **replace** paragraph **following [171]** with the following amended paragraph:

In one embodiment, one or more personality identifiers [[is]] are embedded in a general document token along with one or more document references (e.g., URL's) that each identify a meta-document. In one embodiment, each personality is specified as a service parameter of the requested service, which is encoded as a service identifier in the general document token. (See specifically elements 36 and 38 in Figures 3A and 3B of U.S. Patent Application Serial No. 09/118,322, and their associated description.) Once the contents of a general document token embodying a personality identifier is communicated to the meta-document server and received by the user manager 214 (as shown in Figure 2), the user manager 214 then adds the one or more personalities to the referenced meta-document(s).

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8. Please **replace** paragraph **following [180]** with the following amended paragraph:

Personalities may be alternatively developed using predefined service tags. In this alternate embodiment, the personality tag 502 represents a service and not a personality. In this embodiment, users capture a collection of one or more document service requests 106 that are stored in a service tag 502 using for example tag reader 506. Using the captured collection, the user defines a personality with it. This personality can then be attached to a document for enrichment in accordance therewith. Unlike personality tags, document service tags can be much more specific. In one embodiment shown in Figure 2, a hardcopy newspaper 230 includes a service tag 232 that identifies a service that will enrich a document in accordance with the content from the newspaper of the service tag attached thereto.

9. Please **replace** paragraph **following [195]** with the following amended paragraph:

If the insertion point is selected to occur after the document is rendered to postscript, the postscript driver is alerted to create a copy of the document before sending it to the selected printer. Subsequently, a personality ~~[[to]]~~ attached to the rendered postscript document. Both the postscript document and its attached personality are stored on the meta-document server 200 for enrichment to take place. If either the name of the document, and/or the identifier of the user who submitted the document to the device are available to the device driver, then the location of the personality-enriched document is communicated to the user via some notification service (e.g., email, smart cover sheet, etc.). Smart coversheets are disclosed in U.S. Patent Application No. 09/746,913, which is incorporated herein by reference.

10. Please **replace** paragraph **following [442]** with the following amended paragraph:

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This section describes a mechanism that uses an information space surrounding a document to provide an improved (e.g., more accurate and more stylish) document-centric auto-completion system and auto-correction system that can be used during content creation. Document auto-completion saves a user from having to retype text (and other document content such as graphics) and related markup such as as hyperlinks, bibliographic entries etc., by providing suggestions of words that have been used previously in a contextually similar manner. Document auto-correction provides a textual correction system that dynamically updates the information space as corrections are made or accepted.

11. Please **replace** paragraph **following [460]** with the following amended paragraph:

Subsequently at 4506, the module 4406 waits for a signal from text editor 4314 that document content 4203 has been added and/or edited. At 4508, the information space is updated based on the added and/or edited document content. At 4510, the updated information space (i.e., added and/or edited document content and enrichment associated therewith) is processed for entities that could potentially be used for auto-completion. At 4512, if extracted entities are deemed to be appropriate for auto-completion, then they are indexed and inserted into the database of entities 4214; otherwise, or upon completion of 4512, the service 4406 waits for additional signals from the editor 4314.

12. Please **replace** paragraph **following [467]** with the following amended paragraph:

Also, other factors such as the length of entities, highlighting information (i.e. are headings, bold, hyperlinked, etc.), markup information (such as hyperlinks, footnotes etc.), location of the entity in a document, its frequency in a document (or within a corpus) could be used in any combination to determine the utility of inserting the entity into the entity completion database. Those entities with a utility above a certain threshold are selected and inserted into the entity database. In one embodiment, the utility of an entity is determined using a weighted linear combination of factors as set forth below:

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$$\begin{aligned}
 \text{Utility}(\text{entity}) = & \sum_{\text{factors}} \text{weight}_{\text{factor}}(\text{factor}) = \\
 & \text{weight}_{\text{bold}}(\text{bolded}(\text{true} = 1; \text{false} = 0)) + \\
 & \text{weight}_{\text{italic}}(\text{italic}(\text{true} = 1; \text{false} = 0)) + \\
 & \vdots \\
 & \text{weight}_{\text{uppercase}}(\text{uppercase}(\text{true} = 1; \text{false} = 0)) + \\
 & \text{weight}_{\text{location}} \left(1 - \frac{\text{location of word}}{\text{document length}} \right) + \\
 & \text{weight}_{\text{frequency}} \left(\frac{\text{frequency of word occurring in document}}{\text{highest frequency of any word in document}} \right) + \\
 & \text{weight}_{\text{corpus}} \left(\frac{\text{frequency of word occurring in corpus}}{\text{highest frequency of any word in corpus}} \right).
 \end{aligned}$$

13. Please **replace** paragraph **following [472]** with the following amended paragraph:

Subsequently, a query is formulated at 4606 using the extracted context information and string fragment. In one embodiment, the query can simply be the string fragment. In alternative embodiment, the query can be expanded using various contextual information that may lead to more accurate suggestions for completion. For example, the auto-completion system could process the sentence of which the string fragment is a member using linguistic processing tools such as XeLDA (Xerox Linguistic Development Architecture) described in U.S. Patent No. 6,321,372 ~~Application Serial No. 09/221,232~~, which is incorporated herein by reference.

14. Please **replace** paragraph **following [475]** with the following amended paragraph:

At 4608, the formulated query is submitted to the information retrieval system 4308 in the auto-completion module 4302. In operation, the information retrieval system 4308 locates matches subject to the constraints specified in the query using known matching techniques. The matched items are retrieved and ranked based on their level of appropriateness for completion (i.e., how well they satisfy the query constraints and possibly additional constraints such how near each

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matched item is to a previously completed item) at 46104642. The top ranked match that contains the same (or similar) initial characters typed by the user is displayed for user acceptance at 46124644. In an embodiment, the suggested completion is displayed in a fashion that is distinct from the text that the user has typed. For example, if the user's text is shown in black, the completion will be shown in gray.

15. Please **replace** paragraph **following [485]** with the following amended paragraph:

After a word or phrase is accepted by a user (e.g., simply by clicking with a pointer thereon) in the user in popup window 4708 as indicated by arrow 47144746, then feedback is provided to the user in the window 4704, as indicated by arrow 4716, that the word match was selected and copied into the target document with appropriate formatting and/or enrichment (e.g., links to other content) as shown at 4718. If the user decides to stop the auto-completion process, then the auto-completion process is terminated. Otherwise, additional word(s) may be offered to the user for user acceptance by selecting RE-RANK at 4720. The auto-completion process terminates if the user decides to do so by selecting 4722 or automatically if no new words are offered to the user (e.g., it loops back to the first word matched).

16. Please **replace** paragraph **following [535]** with the following amended paragraph:

The second action involves evaluating whether the personalities (i.e., $P_{1,1}$ to $P_{1,l}$) specified in the exported meta-document file are standard personalities. This second action is performed using properties that identify the personalities (e.g., name, creator, version number, unique identifier defined, for example, using the Digital Object Identifier standard, etc.). Standard personalities may, for example, be provided by software vendors and may be used by multiple systems. For all standard personalities, the exchange process matches the equivalent standard personalities from $P_{2,1}$ to $P_{2,n}$ to the personalities specified in the exported meta-document file. Identified matches are inserted into (or attached to) the new meta-document. Consequently, services and service providers associated with standard personalities are also inserted (or attached to), provided they correspond to services available at the importing meta-document server.

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17. Please **replace** paragraph [536] with the following amended paragraph:

The third action involves identifying "standalone services" that are specified outside a personality (i.e., $S_{1,1}$ to $S_{1,j}$). Similar to personalities, the third action matches standard services available at the importing meta-document server using properties that identify the services in the exported meta-document file. Subsequently at this third action, these identified services are inserted (or attached to) in the new meta-document file. Consequently, any local dictionaries and strategies associated with these services are also inserted (or attached to), provided they correspond to dictionaries and strategies available at the importing meta-document server.

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